UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/904,360	07/12/2001	Giuseppe Curello	Z&PINFP-08190	1413

24131 7590 03/29/2004

LERNER AND GREENBERG, PA
P O BOX 2480
HOLLYWOOD, FL 33022-2480

EXAMINER	
ANYA, IGWE U	
ART UNIT	**PAPER NUMBER**
2825	

DATE MAILED: 03/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/904,360	Applicant(s) CURELLO ET AL.	
	Examiner Igwe U. Anya	Art Unit 2825	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 July 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 5, 8 –13, 15, and 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Yu et al. (US Patent 6399450).

3. Yu teaches a silicon substrate (14), producing a doping by ion implantation (fig. 2) at the surface of the substrate using ions selected from B, P, As, In, and Sb (col. 6 lines 10 – 21), depositing an amorphous silicon layer (53) at low temperature by LPCVD (col. 5 lines 53 – 63) on the surface, performing a low temperature RTA at 500 – 600 degrees C and a high temperature RTA at 1000 – 1100 degrees C to produce an epitaxial layer and a buried doping (col. 6 lines 22 – 65).

4. Claims 1, and 2 are rejected under 35 U.S.C. 102(e) as being anticipated by Kameyama et al. (US Patent 5296388).

5. Kameyama et al. teach a silicon substrate (100), providing a doping on the surface (fig. 1), depositing an amorphous layer (110) on the surface (fig. 2), producing

an amorphous layer (112) that extends into the substrate by ion implantation (col. 7 line 64 – col. 8 line 13), and annealing to produce an epitaxial layer and a buried doping (col. 8 lines 14 – 35).

6. Claim 21 is rejected under 35 U.S.C. 102(b) as being anticipated by Taka et al. (US Patent 4853342).

7. Taka et al. teach a semiconductor substrate (21), producing a doping (22) by ion implantation (fig. 1A) at the surface of the substrate using ions selected from B, P, As, In, and Sb (col. 3 lines 38 – 55), depositing a polysilicon layer (26) on the surface (fig. 1D), subjecting the assembly to ion bombardment to destroy the oxide layer between the substrate and the polysilicon (col. 4 lines 15 – 34), annealing to produce an epitaxial layer, a buried doping (col. 4 lines 35 – 45), and an oxide (30), and a wet etch to remove the oxide (col. 4 lines 60 – 64).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 3, 4, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kameyama et al. (US Patent 5296388) in view of Maszara et al. (US Patent 6362063).

10. The Kameyama et al. reference teaches the feature previously outlined, but lacks ion bombardment selected from silicon, germanium and noble gas to extent the amorphous layer, and performing an RTA 10 to 60 seconds.

11. However, Maszara et al. teach ion bombardment with neutral ions selected from silicon, germanium and noble gas (col. 2 line 64 – col. 3 line 30) to form amorphous layer (102) to preserve the doping profile, and performing an RTA for a result effective time period of 10 to 60 seconds to re-crystallize (col. 4 line 18 – 24).

12. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Maszara et al. into the Kameyama reference to use neutral ion to preserve the doping profile.

13. Claims 14, 19, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yu (US Patent 6399450) in view of Maszara et al. (US Patent Number 6362063).

14. The Yu reference teaches the feature previously outlined, but lacks amorphous silicon of 20 – 40 nm, and a re-crystallizing temperature of 650 degrees C.

15. However, Maszara et al. teach amorphous silicon of 20 – 40 nm (col. 3 lines 6 – 30) and a re-crystallizing temperature of 650 degrees C. to diffusion of the dopant (col. 4 line 18 – 24).

16. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Maszara et al. into the Yu reference and re-crystallize at low temperature. Where the general conditions of a

claim are disclosed in prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ

17. Claims 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yu (US Patent 6399450) in view of Taka et al. (US Patent 4853342).

18. The Yu reference teaches the feature previously outlined, except performing crystallization at the same time as formation of a gate oxide, and performing a wet etch.

19. However, Taka et al. teach crystallization at the same time as formation of a gate oxide, and performing a wet etch (col. 3 lines 6 – 30) and a re-crystallizing temperature of 650 degrees C. to diffusion of the dopant (col. 4 lines 46 – 64) to form a transistor.

20. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Taka et al. into the Yu reference to form a transistor.

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Igwe U. Anya whose telephone number is (751) 272-1887. The examiner can normally be reached on M - F 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S. Smith can be reached on (751) 272-1907. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Igwe U. Anya
Examiner
Art Unit 2825

IA

March 19, 2004

MATTHEW SMITH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800